

## SEQUENCE LISTING

<110> Rajgarhia, Vineet  
 <120> Methods and materials for synthesis of organic products  
 <130> 00-1237-A  
 <140> 09  
 <141> 2001-11-23  
 <150> 60/252,541  
 <151> 2000-11-22  
 <160> 65  
 <170> PatentIn version 3.1  
 <210> 1  
 <211> 92  
 <212> DNA  
 <213> artificial sequence - multiple cloning site  
 <400> 1  
 cccaagcttg aattccccgg gggatccctg cagggtacca cgcgtagatc tactagtgcg  
 60  
 gccgcctcga gtctagaggg cccaagcttg gg  
 92  
 <210> 2  
 <211> 91  
 <212> DNA  
 <213> artificial sequence - multiple cloning site  
 <400> 2  
 ccaagcttgg gccctctaga ctcgaggcgg ccgcactagt agatctacgc gtggtaccct  
 60  
 gcagggatcc cccggggaat tcaagcttgg g  
 91  
 <210> 3  
 <211> 31

<212> DNA  
 <213> Lactobacillus helveticus

<400> 3  
 ccgggatcca tggcaagaga ggaaaaacct c  
 31

<210> 4  
 <211> 32  
 <212> DNA  
 <213> Lactobacillus helveticus

<400> 4  
 ccaagatctt tattgacgaa ccttaacgcc ag  
 32

<210> 5  
 <211> 37  
 <212> DNA  
 <213> Pediococcus acidilactici

<400> 5  
 ccgggatcca tgtctaatat tcaaaatcat caaaaag  
 37

<210> 6  
 <211> 33  
 <212> DNA  
 <213> Pediococcus acidilactici

<400> 6  
 ccaagatctt tatttgcctt gtttttcagc aag  
 33

<210> 7  
 <211> 82  
 <212> DNA  
 <213> Kluyveromyces marxianus

<400> 7  
 taaacagtac aatcgcaaag aaaagctcca cacccaagacc aaataattgc aatgcaactt  
 60

ctttttctttt tttttctttt ct  
82

<210> 8  
<211> 79  
<212> DNA  
<213> Kluyveromyces marxianus

<400> 8  
ttataaaatc attaaaatcc aaaatcgtaa tttatctctt tatectctcc ctctctacat  
60

gccggtagag gtgtggtca  
79

<210> 9  
<211> 1736  
<212> DNA  
<213> kanamycin resistance gene

<400> 9  
gtacaacttg agcaagttgt cgatcagctc ctcaaattgg tctctgtaa cggatgactc  
60

aacttgacaa ttaacttgaa getcagtcga ttgagtgaac ttgatcaggt tgtgcagctg  
120

gtcagcagca tagggaaaca cggcttttcc taccaaactc aaggaattat caaactctgc  
180

aacacttgcg tatgcaggta gcaagggaaa tgtcatactt gaagtcggac agtgagtgta  
240

gtcttgagaa attctgaagc cgtattttta ttatcagtga gtcagtcac caggagatcct  
300

ctacgccgga cgcategtgg ccgacctgca gggggggggg gggcgctgag gtctgcctcg  
360

tgaagaaggt gttgctgact cataccaggc ctgaatcgcc ccatcatcca gccagaaagt  
420

gagggagcca cggttgatga gagctttggt gtaggtggac cagttggtga ttttgaactt

480

ttgctttgcc acggaacggt ctgcgttgtc gggaagatgc gtgatctgat ctttcaactc  
540

agcaaaagtt cgatttattc aacaaagccg ccgtcccgtc aagtcagcgt aatgctctgc  
600

cagtgttaca accaattaac caattctgat tagaaaaact catcgagcat caaatgaaac  
660

tgcaatttat tcatatcagg attatcaata ccatattttt gaaaaagccg tttctgtaat  
720

gaaggagaaa actcaccgag gcagttccat aggatggcaa gatcctggta tcggtctgcg  
780

attccgactc gtccaacatc aatacaacct ttaatttccc ctggtcaaaa ataaggttat  
840

caagtgagaa atcaccatga gtgacgactg aatccggtga gaatggcaaa agcttatgca  
900

ttctttccag acttggtcaa caggccagcc attacgctcg tcatcaaaat cactcgcac  
960

aaccaaaccg ttattcattc gtgattgcgc ctgagcgaga cgaaatagcg gatcgctggt  
1020

aaaaggacaa ttacaaacag gaatcgaatg caaccggcgc aggaacactg ccagcgcac  
1080

aacaatattt tcacctgaat caggatatcc ttctaatacc tggaatgctg ttttcccggg  
1140

gatcgcagtg gtgagtaacc atgcatcac aggagtagcg ataaaatgct tgatggtcgg  
1200

aagaggcata aattccgtca gccagtttag tctgaccac tcatctgtaa catcattggc  
1260

aacgctacct ttgccatggt tcagaaacaa ctctggcgca tcgggcttcc catacaatcg  
1320

atagattgtc gcacctgatt gcccgacatt atcgcgagcc catttatacc catataaatc  
1380

agcatccatg ttggaattta atcgcggcct cgagcaagac gtttcccggt gaatatggct  
1440

cataacaccc cttgtattac tgtttatgta agcagacagt tttattgttc atgatgatat  
1500

atttttatct tgtgcaatgt aacatcagag attttgagac acaacgtggc tttccccccc  
1560

ccccctgcag gtcggcatca cggcgccac aggtgcggtt gctggcgctt atatcgccga  
1620

catcacgat ggggaagatc gggctcgcca cttegggctc atgagcgctt gtttcggcgt  
1680

gggtatggtg gcaggccccg tggccggggg actgttgggc gccatctcct tgcattg  
1736

<210> 10

<211> 372

<212> DNA

<213> Kluyveromyces marxianus

<400> 10

ccggttcttt ctcttactct tacaagacca agaacattgt cgaattccac tccgactaca  
60

tcaaggtcag aaacgccact ttcccagggtg tccaaatgaa gttcgtcttg caaaagttgt  
120

tgaccaaggt caaggatgct gctaagggtt acaagccagt tccagttcct cacgctccaa  
180

gagacaacaa gccagttgct gactctactc cattgaagca agaatgggtc tggactcaag  
240

tccgtaagtt cctacaagaa ggtgatgttg ttctaactga aaccgggtacc tccgctttcg  
300

gtatcaacca aaccacttc ccaaagaca cctacggtat ctccaagtc ttgtgggggt  
360

ccattggttt ca  
372

<210> 11  
 <211> 747  
 <212> DNA  
 <213> Kluyveromyces thermotolerans

<400> 11  
 ttaccactgt cttcgggtctg ccagggtgact tcaatctgcg tctggttgac gagatctacg  
 60

aggctcgaggg tatgagatgg gccggtaact gtaacgagtt gaacgcttct tacgctgccg  
 120

acgcttacgc cagaatcaag ggtatgtcct gtttgatcac caccttcggt gtcggtgagt  
 180

tgtccgcttt gaacgggtatc gccggttctt acgctgagca cgtcgggtgc ttgcacattg  
 240

tcgggtgtccc atccgtctcc gccaggcca agcagctatt gttgcaccac accttgggta  
 300

acgggtgactt cactgtcttc cacagaatgt ccgccaaacat ctctgagacc actgctatga  
 360

tcactgatct agctaccgcc ccatctgaga tcgacagatg tatcagaacc acctacatta  
 420

gacagagacc tgtctacttg ggtttgccat ctaacttcgt tgaccagatg gtcccagcct  
 480

ctctattgga caccccaatt gacttggcct tgaagccaaa cgaccagcag gctgaggagg  
 540

aggtcattct tactttgttg gagatgatca aggacgctaa gaaccagtc atcttggctg  
 600

acgcttgccg ttccagacac gatgtcaagg ctgagaccaa gaagttgatt gacatcactc  
 660

agttcccatc tttcggttacc ccaatgggta agggttccat tgacgagaag caccacaagat  
 720

tcggtggtgt ctacgtcggg accttgt  
 747

<210> 12  
 <211> 1738  
 <212> DNA  
 <213> kanalycin resistance gene fragment

<400> 12  
 gtacaacttg agcaagttgt cgatcagctc ctcaaattgg tcctctgtaa cggatgactc  
 60

aacttgacac ttaacttgaa gctcagtcga ttgagtgaac ttgatcaggt tgtgcagctg  
 120

gtcagcagca tagggaaaca cggcttttcc taccaaactc aaggaattat caaactctgc  
 180

aacacttgcg tatgcaggta gcaagggaaa tgtcatactt gaagtcggac agtgagtgta  
 240

gtcttgagaa attctgaagc cgtattttta ttatcagtga gtcagtcac caggagatcct  
 300

ctacgccgga cgcacgtgg cgcacctgca gggggggggg gggcgctgag gtctgcctcg  
 360

tgaagaaggt gttgctgact cataccaggc ctgaatcgcc ccatcatcca gccagaaagt  
 420

gagggagcca cggttgatga gagctttgtt gtaggtggac cagttgggtga ttttgaactt  
 480

ttgctttgcc acggaacggt ctgcgttgtc gggaagatgc gtgatctgat ctttcaactc  
 540

agcaaaagtt cgatttattc aacaaagccg ccgtcccgtc aagtcagcgt aatgctctgc  
 600

cagtgttaca accaattaac caattctgat tagaaaaact catcgagcat caaatgaaac  
 660

tgcaatttat tcatatcagg attatcaata ccatattttt gaaaaagccg tttctgtaat  
 720

gaaggagaaa actcaccgag gcagttccat aggatggcaa gatcctggta tcgggtctgcg  
 780

attccgactc gtccaacatc aatacaacct attaatctcc cctcgtcaaa aataagggtta  
840

tcaagtgaga aatcaccatg agtgacgact gaatccggtg agaatggcaa aagcttatgc  
900

atttctttcc agacttggtc aacaggccag ccattacgct cgtcatcaaa atcactcgca  
960

tcaaccaaac cgttattcat tcgtgattgc gcctgagcga gacgaaatac gcgatcgctg  
1020

ttaaaaggac aattacaaac aggaatcgaa tgcaaccggc gcaggaacac tgccagcgca  
1080

tcaacaatat tttcacctga atcaggatat tcttctaata cctggaatgc tgttttcccg  
1140

gggatcgagc tggtgagtaa ccatgcatca tcaggagtag ggataaaatg cttgatggtc  
1200

ggaagaggca taaattccgt cagccagttt agtctgacca tctcatctgt aacatcattg  
1260

gcaacgctac ctttgccatg tttcagaaac aactctggcg catcgggctt cccatacaat  
1320

cgatagattg tcgcacctga ttgcccagaca ttatcgcgag cccatttata cccatataaa  
1380

tcagcatcca tgttggaatt taatcgcggc ctgagcaag acgtttcccg ttgaatatgg  
1440

ctcataacac cccttgattt actgtttatg taagcagaca gttttattgt tcatgatgat  
1500

atatttttat cttgtgcaat gtaacatcag agattttgag acacaacgtg gctttccccc  
1560

ccccccctgc aggtcggcat caccggcgcc acaggtgcgg ttgctggcgc ctatatcgcc  
1620

gacatcaccg atggggaaga tcgggctcgc cacttcgggc tcatgagcgc ttgtttcggc  
1680



gtgggtatgg tggcaggccc cgtggccggg ggactgttgg gcgccatctc cttgcatg  
1738

<210> 13  
<211> 17  
<212> DNA  
<213> artificial sequence - degenerate amplification primers

<400> 13  
gtbatygggt chggtac  
17

<210> 14  
<211> 17  
<212> DNA  
<213> artificial sequence - degenerate amplification primers

<400> 14  
swrtcdccrt gytacc  
17

<210> 15  
<211> 22  
<212> DNA  
<213> artificial sequence - amplification primers

<400> 15  
gtacagttct ggatactgct cg  
22

<210> 16  
<211> 18  
<212> DNA  
<213> artificial sequence - amplification primers

<400> 16  
acaggcatcg atgctgtc  
18

<210> 17  
<211> 19

<212> DNA  
 <213> Kluyveromyces thermotolerans

<400> 17  
 gtgatgtcgg cgatatagg  
 19

<210> 18  
 <211> 21  
 <212> DNA  
 <213> Kluyveromyces thermotolerans

<400> 18  
 ctacttggag ccaactatcga c  
 21

<210> 19  
 <211> 21  
 <212> DNA  
 <213> Kluyveromyces thermotolerans

<400> 19  
 gatctcctgc taagctcttg c  
 21

<210> 20  
 <211> 20  
 <212> DNA  
 <213> Kluyveromyces thermotolerans

<400> 20  
 gcagttttgg atattcatgc  
 20

<210> 21  
 <211> 972  
 <212> DNA  
 <213> Kluyveromyces thermotolerans

<400> 21  
 atgttccaag atacaaagtc tcaagcagta agaactgatg ccaaaacagt aaaagttgtg  
 60

gtagtgggag tgggaagtgt tgggtctgcc acagcgtata cgttgcttct cagcggcatc  
120

gtttccgaga ttgtccttat cgacgtgaac aaagacaaag cagaggggtga aagcatggac  
180

ttaaaccacg cagcaccttc aaatacaagg tctcgagcgg gtgattatcc tgactgcgct  
240

ggcgcggcca ttgttattgt cacatgtggg attaaccaaa aaaatggaca aacaaggatg  
300

gatcttgctg caaaaaatgc caacattatg ctggaaatca tccccaatgt tgccaaatat  
360

gctcctgata ccatacctgct tattgccacg aatcctgtcg atgttttgac ctatattagc  
420

tataaggcgt cagggtttcc actaagcaga gttatcggct caggtacagt tctggatact  
480

gctcgtttta aatacatcct cggagagcac ttcaagatct catcggacag catcgatgcc  
540

tgtgtaattg gagaacatgg tgattcgggt gtgcctgtct ggtctcttac caacatcgac  
600

ggcatgaagc tccgggatta ctgcgaaaaa gccaaaccaca tatttgatca gaatgcgttc  
660

catagaatct ttgagcaaac gcgagacgct gcttacgata tcatcaagcg caaaggctat  
720

acttcatatg gaatcgcagc gggattactt cgcatagtaa aggcgatttt agaggataca  
780

ggatccacac ttacagtttc aaccgttggg gattattttg gggttgaaca aattgctata  
840

agcgtcccta ccaaactcaa taaaagtggg gctcatcaag tggctgaact ttcactcgat  
900

gagaaggaaa tagaattgat ggaaaaatca gctagtcaga tcaaatacgt gattgagcat  
960

ctggagatca at  
972

<210> 22  
<211> 323  
<212> PRT  
<213> Kluyveromyces thermotolerans  
  
<400> 22

Met Phe Gln Asp Thr Lys Ser Gln Ala Val Arg Thr Asp Ala Lys Thr  
1 5 10 15

Val Lys Val Val Val Val Gly Val Gly Ser Val Gly Ser Ala Thr Ala  
20 25 30

Tyr Thr Leu Leu Leu Ser Gly Ile Val Ser Glu Ile Val Leu Ile Asp  
35 40 45

Val Asn Lys Asp Lys Ala Glu Gly Glu Ser Met Asp Leu Asn His Ala  
50 55 60

Ala Pro Ser Asn Thr Arg Ser Arg Ala Gly Asp Tyr Pro Asp Cys Ala  
65 70 75 80

Gly Ala Ala Ile Val Ile Val Thr Cys Gly Ile Asn Gln Lys Asn Gly  
85 90 95

Gln Thr Arg Met Asp Leu Ala Ala Lys Asn Ala Asn Ile Met Leu Glu  
100 105 110

Ile Ile Pro Asn Val Ala Lys Tyr Ala Pro Asp Thr Ile Leu Leu Ile  
115 120 125

Ala Thr Asn Pro Val Asp Val Leu Thr Tyr Ile Ser Tyr Lys Ala Ser  
130 135 140

Gly Phe Pro Leu Ser Arg Val Ile Gly Ser Gly Thr Val Leu Asp Thr  
 145 150 155 160

Ala Arg Phe Lys Tyr Ile Leu Gly Glu His Phe Lys Ile Ser Ser Asp  
 165 170 175

Ser Ile Asp Ala Cys Val Ile Gly Glu His Gly Asp Gly Val Pro Val  
 180 185 190

Trp Ser Leu Thr Asn Ile Asp Gly Met Lys Leu Arg Asp Tyr Cys Glu  
 195 200 205

Lys Ala Asn His Ile Phe Asp Gln Asn Ala Phe His Arg Ile Phe Glu  
 210 215 220

Gln Thr Arg Asp Ala Ala Tyr Asp Ile Ile Lys Arg Lys Gly Tyr Thr  
 225 230 235 240

Ser Tyr Gly Ile Ala Ala Gly Leu Leu Arg Ile Val Lys Ala Ile Leu  
 245 250 255

Glu Asp Thr Gly Ser Thr Leu Thr Val Ser Thr Val Gly Asp Tyr Phe  
 260 265 270

Gly Val Glu Gln Ile Ala Ile Ser Val Pro Thr Lys Leu Asn Lys Ser  
 275 280 285

Gly Ala His Gln Val Ala Glu Leu Ser Leu Asp Glu Lys Glu Ile Glu  
 290 295 300

Leu Met Glu Lys Ser Ala Ser Gln Ile Lys Ser Val Ile Glu His Leu  
 305 310 315 320

Glu Ile Asn

<210> 23  
 <211> 20  
 <212> DNA  
 <213> artificial sequence - degenerate amplification primers

<400> 23  
 gtygggtgchg gtgchgthgg  
 20

<210> 24  
 <211> 17  
 <212> DNA  
 <213> artificial sequence - degenerate amplification primers

<400> 24  
 swrtcdccrt gytcbcc  
 17

<210> 25  
 <211> 27  
 <212> DNA  
 <213> artificial sequence - amplification primers

<400> 25  
 atccacaaca gcttacacgt tattgag  
 27

<210> 26  
 <211> 28  
 <212> DNA  
 <213> artificial sequence - amplification primers

<400> 26  
 gtttggttgc tggaagtggg gttgatag  
 28

<210> 27  
 <211> 27  
 <212> DNA

<213> artificial sequence - amplification primers

<400> 27

aacattgaat agcttgctca ggttggtg  
27

<210> 28

<211> 28

<212> DNA

<213> artificial sequence - amplification primers

<400> 28

gataataaac gcgttgacat ttcagatg  
28

<210> 29

<211> 939

<212> DNA

<213> *Torulaspora pretoriensis*

<220>

<221> CDS

<222> (1)..(939)

<223>

<400> 29

atg cat aga tgt gct aaa gtg gcc atc gtc ggt gcc ggc caa gtt gga  
48

Met His Arg Cys Ala Lys Val Ala Ile Val Gly Ala Gly Gln Val Gly

1 5 10 15

tcc aca aca gct tac acg tta tta ttg agt agt ttg gtt gct gaa gtg  
96

Ser Thr Thr Ala Tyr Thr Leu Leu Leu Ser Ser Leu Val Ala Glu Val

20 25 30

gtg ttg ata gat gtc gat aaa aga aag gtc gaa ggc caa ttt atg gat  
144

Val Leu Ile Asp Val Asp Lys Arg Lys Val Glu Gly Gln Phe Met Asp

35

40

45

ctg aac cac gcg gct cct tta acg aag gag tca cga ttc agt gct ggg  
192

Leu Asn His Ala Ala Pro Leu Thr Lys Glu Ser Arg Phe Ser Ala Gly

50

55

60

gac tat gaa agt tgt gct gat gct gcg gtt gta atc gta acg ggc ggg  
240

Asp Tyr Glu Ser Cys Ala Asp Ala Ala Val Val Ile Val Thr Gly Gly

65

70

75

80

gct aat cag aaa cct ggt caa act aga atg gag cta gcc gag agg aac  
288

Ala Asn Gln Lys Pro Gly Gln Thr Arg Met Glu Leu Ala Glu Arg Asn

85

90

95

gtt aaa atc atg cag gaa gtg atc cct aag att gtg aaa tac gcc ccc  
336

Val Lys Ile Met Gln Glu Val Ile Pro Lys Ile Val Lys Tyr Ala Pro

100

105

110

aac gca att ttg ctg att gca aca aac cct gtc gat gta ctt acc tat  
384

Asn Ala Ile Leu Leu Ile Ala Thr Asn Pro Val Asp Val Leu Thr Tyr

115

120

125

gct agt ttg aaa gcg tcg gga ttc cca gca agc cgg gtt att ggt tct  
432

Ala Ser Leu Lys Ala Ser Gly Phe Pro Ala Ser Arg Val Ile Gly Ser

130

135

140



ggg aca gtt ctc gac tct gct cgt ata cag cac aac ctg agc aag cta  
480

Gly Thr Val Leu Asp Ser Ala Arg Ile Gln His Asn Leu Ser Lys Leu

145 150 155 160

ttc aat gtt tca tct gaa agt gtc aac gcg ttt att atc ggg gaa cat  
528

Phe Asn Val Ser Ser Glu Ser Val Asn Ala Phe Ile Ile Gly Glu His

165 170 175

ggt gac tca agt gtg ccc gtc tgg tcg ctt gct gag att gcc ggc atg  
576

Gly Asp Ser Ser Val Pro Val Trp Ser Leu Ala Glu Ile Ala Gly Met

180 185 190

aaa gtg gag gat tac tgt agg cag tcc aag aga aag ttt gac ccc agc  
624

Lys Val Glu Asp Tyr Cys Arg Gln Ser Lys Arg Lys Phe Asp Pro Ser

195 200 205

att ctg acc aaa ata tat gag gag tcg cgt gac gcg gca gcc tac atc  
672

Ile Leu Thr Lys Ile Tyr Glu Glu Ser Arg Asp Ala Ala Ala Tyr Ile

210 215 220

ata gaa cgc aaa ggc tat acc aat ttc ggg att gca gca ggt ttg gct  
720

Ile Glu Arg Lys Gly Tyr Thr Asn Phe Gly Ile Ala Ala Gly Leu Ala

225 230 235 240

agg ata gtg aga gct att ctg aga gat gaa ggt gcc cta tta act gtg  
768

Arg Ile Val Arg Ala Ile Leu Arg Asp Glu Gly Ala Leu Leu Thr Val

245

250

255

tct act gta ggt gag cac ttt ggc atg aaa gat gtt tca ttg agt gtt  
816

Ser Thr Val Gly Glu His Phe Gly Met Lys Asp Val Ser Leu Ser Val

260

265

270

cca act agg gta gac agg agc ggc gct cac cat gtc gtc gac ctt ctg  
864

Pro Thr Arg Val Asp Arg Ser Gly Ala His His Val Val Asp Leu Leu

275

280

285

cta aac gac aag gag ctg gag caa att aaa aca tct gga gcc aag ata  
912

Leu Asn Asp Lys Glu Leu Glu Gln Ile Lys Thr Ser Gly Ala Lys Ile

290

295

300

aag tca gcc tgt gat gaa ctt ggc att  
939

Lys Ser Ala Cys Asp Glu Leu Gly Ile

305

310

&lt;210&gt; 30

&lt;211&gt; 313

&lt;212&gt; PRT

<213> *Torulaspora pretoriensis*

&lt;400&gt; 30

Met His Arg Cys Ala Lys Val Ala Ile Val Gly Ala Gly Gln Val Gly  
1 5 10 15

Ser Thr Thr Ala Tyr Thr Leu Leu Leu Ser Ser Leu Val Ala Glu Val  
20 25 30

Val Leu Ile Asp Val Asp Lys Arg Lys Val Glu Gly Gln Phe Met Asp  
35 40 45

Leu Asn His Ala Ala Pro Leu Thr Lys Glu Ser Arg Phe Ser Ala Gly  
50 55 60

Asp Tyr Glu Ser Cys Ala Asp Ala Ala Val Val Ile Val Thr Gly Gly  
65 70 75 80

Ala Asn Gln Lys Pro Gly Gln Thr Arg Met Glu Leu Ala Glu Arg Asn  
85 90 95

Val Lys Ile Met Gln Glu Val Ile Pro Lys Ile Val Lys Tyr Ala Pro  
100 105 110

Asn Ala Ile Leu Leu Ile Ala Thr Asn Pro Val Asp Val Leu Thr Tyr  
115 120 125

Ala Ser Leu Lys Ala Ser Gly Phe Pro Ala Ser Arg Val Ile Gly Ser  
130 135 140

Gly Thr Val Leu Asp Ser Ala Arg Ile Gln His Asn Leu Ser Lys Leu  
145 150 155 160

Phe Asn Val Ser Ser Glu Ser Val Asn Ala Phe Ile Ile Gly Glu His  
165 170 175

Gly Asp Ser Ser Val Pro Val Trp Ser Leu Ala Glu Ile Ala Gly Met  
180 185 190

Lys Val Glu Asp Tyr Cys Arg Gln Ser Lys Arg Lys Phe Asp Pro Ser  
195 200 205

Ile Leu Thr Lys Ile Tyr Glu Glu Ser Arg Asp Ala Ala Ala Tyr Ile

210

215

220

Ile Glu Arg Lys Gly Tyr Thr Asn Phe Gly Ile Ala Ala Gly Leu Ala  
 225 230 235 240

Arg Ile Val Arg Ala Ile Leu Arg Asp Glu Gly Ala Leu Leu Thr Val  
 245 250 255

Ser Thr Val Gly Glu His Phe Gly Met Lys Asp Val Ser Leu Ser Val  
 260 265 270

Pro Thr Arg Val Asp Arg Ser Gly Ala His His Val Val Asp Leu Leu  
 275 280 285

Leu Asn Asp Lys Glu Leu Glu Gln Ile Lys Thr Ser Gly Ala Lys Ile  
 290 295 300

Lys Ser Ala Cys Asp Glu Leu Gly Ile  
 305 310

<210> 31  
 <211> 21  
 <212> DNA  
 <213> Bacillus megaterium

<400> 31  
 cctgagtcga cgtcattatt c  
 21

<210> 32  
 <211> 22  
 <212> DNA  
 <213> Bacillus megaterium

<400> 32  
 tgaagctatt tattcttggt ac  
 22

<210> 33  
<211> 27  
<212> DNA  
<213> Bacillus megaterium

<400> 33  
gctctagatg aaaacacaat ttacacc  
27

<210> 34  
<211> 28  
<212> DNA  
<213> Bacillus megaterium

<400> 34  
atggatcctt acacaaaagc tctgtcgc  
28

<210> 35  
<211> 26  
<212> DNA  
<213> Rhizopus oryzae

<400> 35  
ctttattttt cttacaata taattc  
26

<210> 36  
<211> 19  
<212> DNA  
<213> Rhizopus oryzae

<400> 36  
actagcagtg caaaacatg  
19

<210> 37  
<211> 29  
<212> DNA  
<213> Rhizopus oryzae

<400> 37  
gctctagatg gtattacact caaaggctcg  
29

<210> 38  
<211> 30  
<212> DNA  
<213> Rhizopus oryzae

<400> 38  
gctctagatc aacagctact tttagaaaag  
30

<210> 39  
<211> 28  
<212> DNA  
<213> artificial sequence

<220>  
<223> cloning site sequence

<400> 39  
aaatctagat gagccatatt caacggga  
28

<210> 40  
<211> 29  
<212> DNA  
<213> artificial sequence

<220>  
<223> cloning site sequence

<400> 40  
ccggatcctt agaaaaactc atcgagcat  
29

<210> 41  
<211> 36  
<212> DNA  
<213> Kluyveromyces thermotolerans

<400> 41  
gctctagaat tatgttccaa gatacaaagt ctcaag  
36

<210> 42  
<211> 34  
<212> DNA  
<213> Kluyveromyces thermotolerans

<400> 42  
ccggaattca tcctcaattg atctccagat gctc  
34

<210> 43  
<211> 2229  
<212> DNA  
<213> Kluyveromyces thermotolerans

<400> 43  
gcggccgcgg atcgtcttcc cgctatcgat taattttttt ttctttcttc tttttattaa  
60

ccttaatttt tatttttagat tcctgacctt caactcaaga cgcacagata ttataacatc  
120

tgcacaatag gcatttgcaa gaattactcg tgagtaagga aagagtgagg aactatcgca  
180

tacctgcatt taaagatgcc gatttgggcg cgaatccttt attttggctt caccctcata  
240

ctattatcag ggccagaaaa aggaagtgtt tccctccttc ttgaattgat gttaccctca  
300

taaagcacgt ggctctttat cgagaaagaa attaccgtcg ctcgatgatt gtttgcaaaa  
360

agaacaaaac tgaaaaaacc cagacacgct cgacttctcg tcttctctatt gattgcagct  
420

tccaatttcg tcacacaaca aggtcctagc gacggctcac aggttttgta acaagcaatc  
480

gaaggttctg gaatggcggg aaagggttta gtaccacatg ctatgatgcc cactgtgatc

540

tccagagcaa agttcgttcg atcgtaactgt tactctctct ctttcaaaca gaattgtccg  
600

aatcgtgtga caacaacagc ctgttctcac acactctttt cttctaacca aggggggtggt  
660

ttagtttagt agaacctcgt gaaacttaca ttacatata tataaacttg cataaattgg  
720

tcaatgcaag aaatacatat ttggtctttt ctaattcgta gtttttcaag ttcttagatg  
780

ctttcttttt ctctttttta cagatcatca aggaagtaat tatctacttt ttacaacaaa  
840

tctagaatta tgttccaaga tacaaagtct caagcagtaa gaactgatgc caaacacagta  
900

aaagtgtggt tagtgggagt gggaagtgtt gggctctgcc cagcgtatac gttgcttctc  
960

agcggcatcg ttcccgagat tgtccttata gacgtgaaca aagacaaagc agagggtgaa  
1020

agcatggact taaaccacgc agcaccttca aatacaaggt ctcgagcggg tgattatcct  
1080

gactgcgctg gcgcggccat tgttattgtc acatgtggga ttaaccaaaa aaatggacaa  
1140

acaaggatgg atcttgctgc aaaaaatgcc aacattatgc tggaaatcat cccaatggt  
1200

gccaaatatg ctctgatac catcctgctt attgccacga atcctgtcga tgttttgacc  
1260

tatattagct ataaggcgtc agggtttcca ctaagcagag ttatcggctc aggtacagtt  
1320

ctggatactg ctcgttttta atacatcctc ggagagcact tcaagatctc atcggacagc  
1380

atcgatgcct gtgtaattgg agaacatggt gattcgggtg tgccctgtctg gtctcttacc  
1440



aacatcgacg gcatgaagct cggggattac tgcgaaaaag ccaaccacat atttgatcag  
1500

aatgcgttcc atagaatctt tgagcaaacg cgagacgctg cttacgatat catcaagcgc  
1560

aaaggtata cttcatatgg aatcgcagcg ggattacttc gcatagtaaa ggcgatttta  
1620

gaggatacag gatccacact tacagtttca accgttggtg attattttgg ggttgaacaa  
1680

attgctataa gcgtccctac caaactcaat aaaagtgggg ctcacatcaagt ggctgaactt  
1740

tcactcgatg agaaggaaat agaattgatg gaaaaatcag ctagtcagat caaatcagtg  
1800

attgagcatc tggagatcaa ttgaggatga attcggatcc ggtagatata ttgatgctat  
1860

caatccagag aactggaaag attgtgtagc cttgaaaaac ggtgaaactt acgggtccaa  
1920

gattgtctac agattttcct gatttgccag cttactatcc ttcttgaaaa tatgcactct  
1980

atatctttta gttcttaatt gcaacacata gatttgctgt ataacgaatt ttatgctatt  
2040

ttttaaatth ggagttcagt gataaaagtg tcacagcgaa ttctctcaca tgtagggacc  
2100

gaattgttta caagttctct gtaccaccat ggagacatca aaaattgaaa atctatggaa  
2160

agatatggac ggtagcaaca agaatatagc acgagccgcg gatttatctc gttacgcag  
2220

cgcgccgcg  
2229

<210> 44

<211> 32

<212> DNA  
 <213> *Candida sonorensis*

<400> 44  
 tggactagta aaccaacagg gattgcctta gt  
 32

<210> 45  
 <211> 33  
 <212> DNA  
 <213> *Candida sonorensis*

<400> 45  
 ctagtctaga gatcattacg ccagcatcct agg  
 33

<210> 46  
 <211> 37  
 <212> DNA  
 <213> *Candida albicans*

<400> 46  
 gcgatctcga ggtcctagaa tatgtatact aatttgc  
 37

<210> 47  
 <211> 36  
 <212> DNA  
 <213> *Candida albicans*

<400> 47  
 acttggccat ggtgatagtt attcttctgc aattga  
 36

<210> 48  
 <211> 20  
 <212> DNA  
 <213> *Saccharomyces cerevisiae*

<400> 48  
 tgtcatcact gctccatctt  
 20

<210> 49  
 <211> 20  
 <212> DNA  
 <213> *Saccharomyces cerevisiae*

<400> 49  
 ttaagccttg gcaacatatt  
 20

<210> 50  
 <211> 37  
 <212> DNA  
 <213> *Candida albicans*

<400> 50  
 gcgatctcga ggtcctagaa tatgtatact aatttgc  
 37

<210> 51  
 <211> 39  
 <212> DNA  
 <213> *Candida albicans*

<400> 51  
 cgcgaattcc catgggttagt ttttggttga aagagcaac  
 39

<210> 52  
 <211> 32  
 <212> DNA  
 <213> *Candida sonorensis*

<400> 52  
 tggactagta aaccaacagg gattgcctta gt  
 32

<210> 53  
 <211> 33  
 <212> DNA  
 <213> *Candida sonorensis*

<400> 53  
ctagtctaga gatcattacg ccagcatcct agg  
33

<210> 54  
<211> 44  
<212> DNA  
<213> Candida sonorensis

<400> 54  
ccggaattcg atatctgggc wggkaatgcc aaygarttra atgc  
44

<210> 55  
<211> 44  
<212> DNA  
<213> Candida sonorensis

<220>  
<221> misc\_feature  
<222> (33)..(33)  
<223> primer that does not encode amino acid

<220>  
<221> misc\_feature  
<222> (21)..(21)  
<223> primer that does not encode amino acid

<400> 55  
cgcggaattca ggcctcagta ngaraawgaa ccngtrttra artc  
44

<210> 56  
<211> 10  
<212> PRT  
<213> Candida sonorensis

<400> 56

Trp Ala Gly Asn Ala Asn Glu Leu Asn Ala

1

5

10

<210> 57  
 <211> 10  
 <212> PRT  
 <213> Candida sonorensis

<400> 57

Asp Phe Asn Thr Gly Ser Phe Ser Tyr Ser

1

5

10

<210> 58  
 <211> 18  
 <212> DNA  
 <213> Candida sonorensis

<400> 58  
 tctgttmcct acrtaaga  
 18

<210> 59  
 <211> 20  
 <212> DNA  
 <213> Candida sonorensis

<400> 59  
 gtygggtggc acgaaggtgc  
 20

<210> 60  
 <211> 36  
 <212> DNA  
 <213> Candida sonorensis

<400> 60  
 gcgatctcga gaaagaaacg acccatccaa gtgatg  
 36

<210> 61  
 <211> 68

<212> DNA  
<213> Candida sonorensis

<400> 61  
tggactagta catgcatgcg gtgagaaagt agaaagcaaa cattgtatat agtcttttct  
60

attattag  
68

<210> 62  
<211> 34  
<212> DNA  
<213> Candida sonorensis

<400> 62  
gcgatctcga gaaaatgtta ttataacact acac  
34

<210> 63  
<211> 75  
<212> DNA  
<213> Candida sonorensis

<400> 63  
tggactagta catgcatgcg gtgagaaagt agaaagcaaa cattttgttt gatttgtttg  
60

ttttgttttt gtttg  
75

<210> 64  
<211> 36  
<212> DNA  
<213> Candida sonorensis

<400> 64  
gcgatctcga gaaagaaacg acccatccaa gtgatg  
36

<210> 65  
<211> 35

<212> DNA

<213> Candida sonorensis

.<400> 65

acttgccat ggtatatagt cttttctatt attag

35

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99
0	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99